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Gas Journal

LIGHT - HEAT - POWER - BY-PRODUCTS

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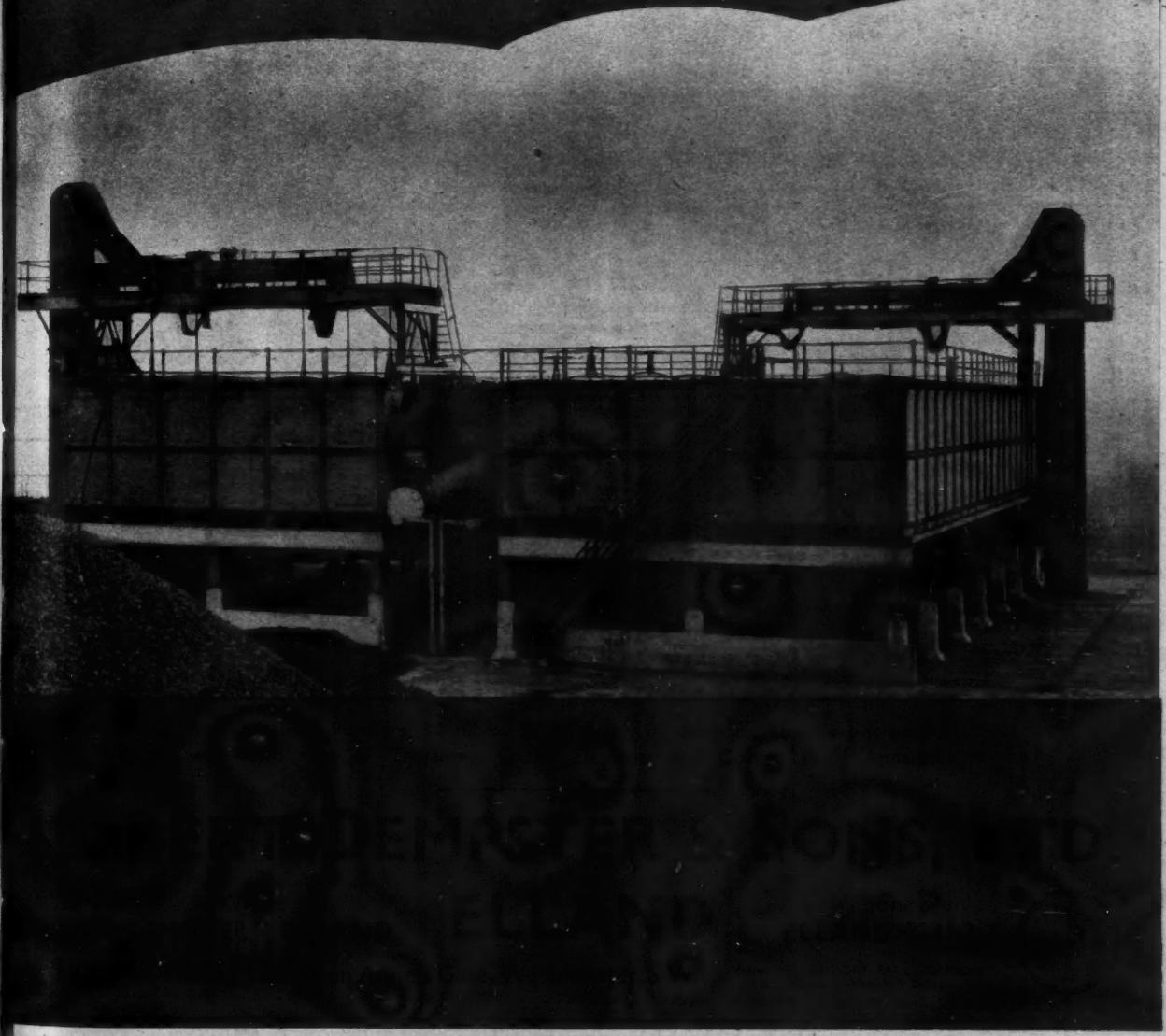

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3 *Diagram showing Rawlbolt fixing with nut tightened.*

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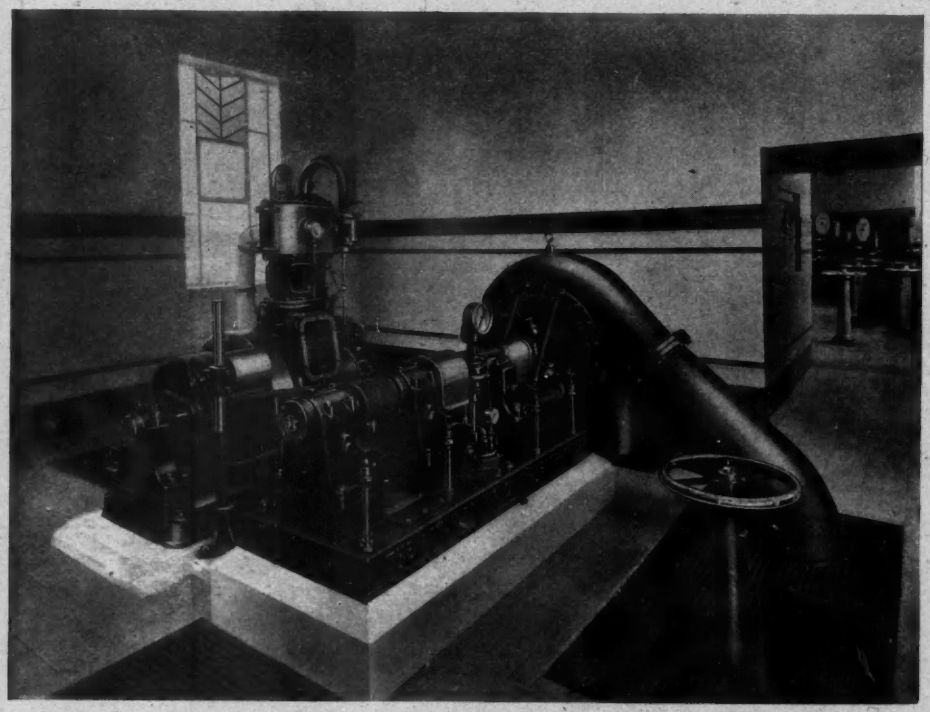

Rateau Turbo Gas Boosters and Exhausters

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Fig. 907.—Rateau Turbo Booster driven by a Vertical High Speed Steam Engine through "V" Ropes.

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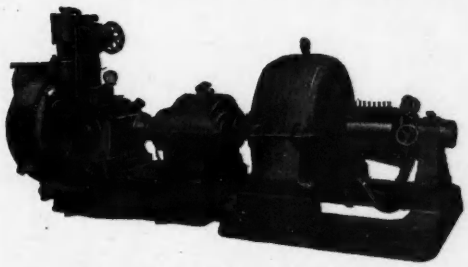

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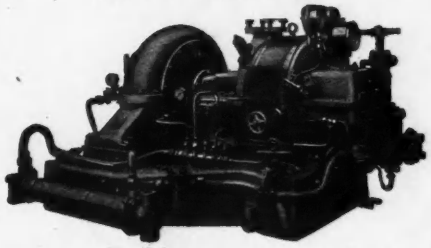

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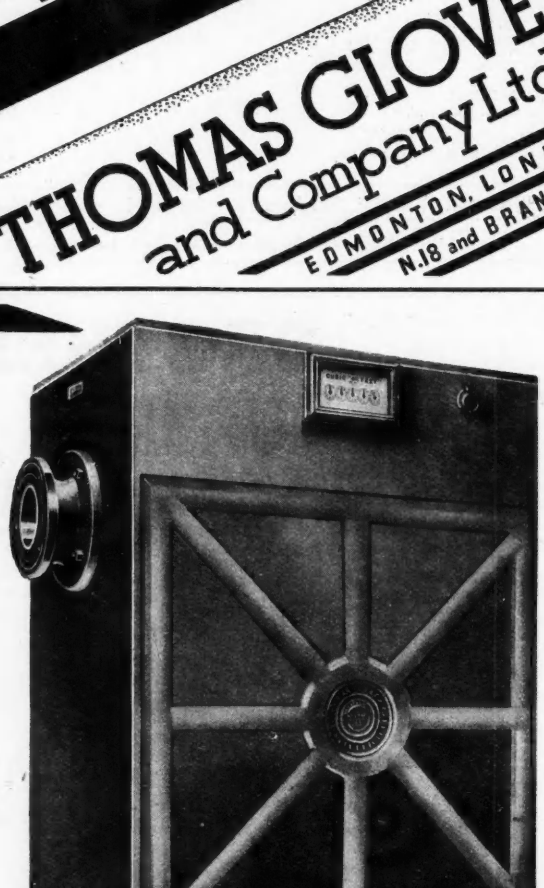

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P.8

GAS JOURNAL, NOV. 10, 1943

VOL. 242 95th YEAR No. 4199

EDITORIAL NOTES

CHEMICAL RESEARCH

THE recent Paper by Lord McGowan on the future of the chemical industry, given at a joint meeting of the Chemical Engineering Group, the Institution of Chemical Engineers, and the London Section of the Society of Chemical Industry (see "JOURNAL" of Oct. 27), deserves careful study in common with the documents of the Parliamentary and Scientific Committee, of Sir Harold Hartley, and of the Federation of British Industries to which we have referred in these columns in relation to research in the Gas Industry. Lord McGowan has distinguished service in and long experience of the chemical industry—an experience extending, we believe, well over fifty years, and his views obviously command more than passing attention. What he had to say is, moreover, particularly pertinent at the present time when so much thought in so many quarters, Governmental, scientific, and industrial, is being directed to the subject of research—its organization and the finding and appropriation of funds for pursuing it in far greater degree. As we have said before, comparisons made with other countries and on different bases may easily be misleading, and the mere voting of money for research must not in itself be taken as full evidence of the effectiveness of that research. The important criterion is quality, which cannot be measured except over long periods of time. But it seems apparent that as a nation and through the industries of the nation there is real necessity for a large increase in our research effort—research by universities, industry, and the Government.

Lord McGowan considered closer definition of the functions of these three agencies working to a common end. He expressed the opinion that the main function of the universities is to train and turn out for the benefit of the community the best type of research worker; all other considerations should be subservient to this end, and research at the universities should consist of the study of fundamental problems. Not that this type of research is in any way less important or urgent than research applied to industrial problems; the point is that the atmosphere of the university laboratory provides the most favourable conditions for its successful prosecution. The function of industrial research is in the first instance to investigate problems with which industry is concerned, but work of a fundamental nature should also be undertaken to strengthen the national effort, and because solutions of industrial problems frequently arise from the study of first principles.

And then, outside the scope of fundamental and industrial research is the vast body of work which must be done under Government auspices—investigations too far removed from straightforward commercial propositions to be undertaken by any independent concern. Lord McGowan instanced coal as being outstanding—coal, "our greatest natural asset, and to which British industry in general owes its existence." The coal picture here to-day, he maintained, is anything but satisfactory. We are making deep inroads into our deposits of easily won and high quality coal. Mining costs are rising in spectacular fashion, the while cheap coal supplies have been developed in other countries; and he asked that two unpalatable facts should be realized and remembered: One, that during the past six years the cost of winning coal in this country has risen by no less than 70%. Two, that pit prices of coal in U.S.A. are lower than corresponding prices in this country by an amount equivalent to about 10s. a ton. Can the chemical industry or, for that matter, industry generally, stand this immense handicap? Is there doubt of the danger which it represents to our export trade?

What about the decline in coal output? Current rate of production is about 190 million tons per annum as compared with an average of 224 million tons for the six years 1933 to 1938. During these same years the quantity of coal consumed in this country averaged 168 million tons per annum. Assuming the decline in production can be arrested and the present rate maintained, and assuming that requirements, including those for industry, remain at their average pre-war level, this would leave a surplus for export of only 22 million tons per annum, as compared with an average of 54 million tons per annum shipped abroad between 1933 and 1938. All of which, of course, emphasizes the great importance of ensuring that every ton of coal consumed in this country, whether for industrial or domestic purposes, shall be utilized to the best advantage. And this goal —we quote Lord McGowan—"can be attained only if a comprehensive programme of research is put in hand and prosecuted with the utmost vigour." Such comprehensive research is, we think, envisaged, if only in first stages, by the Fuel Research Board, the Gas Research Board, the British Coal Utilization Research Association. Lord McGowan suggests that a larger scheme may prove to be necessary. Without arguing the need, there is satisfaction that the machinery for programme co-ordination already exists as far as the fuel industries are concerned in the Standing Consultative Conference, the first meeting of which was reported in the "JOURNAL" last week. And we take heart in the knowledge that over the years the Gas Industry has seen fit to collaborate actively and in practical fashion with both university and Government research department, and is not lacking either in experience or will to render further encouragement from both within and outside rapidly effective.

SMOKELESSNESS

IN very many ways the plans now being formulated for post-war reconstruction and development—town planning, housing, new building, industrial re-equipment, fuel utilization generally in relation to coal conservation—create opportunity for the inclusion of measures that will either prevent smoke pollution or provide the means for its progressive abolition. Now is the time to integrate means for smokelessness into these plans; otherwise the post-war years will witness the unnecessary creation of new sources of smoke, as well as the equally unnecessary continuation of smoke from existing sources. It is wholly desirable that every effort be made now to ensure that full cognizance of the problem is taken by Government departments and the like dealing with subjects into which enter either smoke prevention or the consequences of smoke. Hence we welcomed the energy of the National Smoke Abatement Society in staging a whole-day conference in London last Friday devoted to discussion on measures for the prevention of smoke in post-war reconstruction.

Not that the Society has been idle since the war. Far from it, as our columns testify; and, indeed, we consider that its position and influence are stronger than ever. Certainly last Friday's meeting had an air of optimism and enthusiasm about it. As is known, the Society has already made a series of proposals that have been published in the form of a memorandum, and this has been submitted to the departments concerned. Proposals relating to domestic smoke prevention have been amplified in a further memorandum submitted to the Design of Dwellings Sub-Committee of the Ministry of Health. It is not necessary for us to recapitulate these proposals at all fully or the well-known

§§

arguments leading up to them, but we summarize the more important points which really formed the basis of discussion at the meeting. First in regard to fuel-burning appliances in premises other than domestic, it is urged that all new plant and equipment, and alterations, should be required to receive the approval of a competent authority as to efficiency, suitability, and smokelessness before they are installed. In many industrial plants this will not end the possibility of smoke, and further control may be required, but in what are termed "commercial premises" (*e.g.*, offices, hotels, &c.) smokeless installations can be readily ensured and should be made obligatory. When we turn to domestic smoke, given requisite attention in good time for planning the increased production of the smokeless fuels and appliances required, all post-war housing can be made entirely smokeless. This reform, considerable though it is, is feasible, and will in more ways than one be advantageous to the national well-being. In the event, however, of its not being completely attained from the beginning, then it may be urged that not more than one open fire should be permitted in each house, and that this should be of the most modern and efficient type available, and capable of burning any form of smokeless fuel without structural alteration.

A further proposal is that central or other suitable areas in all large towns should be scheduled to be rebuilt only with smokeless methods, so that at an appropriate date they may be declared to be smokeless zones. These smokeless zones will eventually include the whole of each town. This further stage is embodied in the Society's "Ten Year Plan," to which we have already referred in the "JOURNAL." A new proposal of importance has been made suggesting that the establishment of local or regional authorities for the approval of installations will require some form of national co-ordination to secure uniformity of practice and the dissemination of new information, particularly on technical advances. The control organization required could concern itself with the task of surveying the sources of pollution with a view to establishing the responsibility of each type of source, with regard to both the quantity and the nature of emission. Such work, designed entirely from the preventive standpoint, could be associated with the promotion or co-ordination of researches aiming to prevent such pollution, or with ensuring that the use of new methods and techniques resulting from research is made known to and encouraged by the authorities dealing with new installations and alterations.

Actually the Society's proposals have had some publicity, and have received resolutions of support from over eighty local authorities, including most of the larger cities and boroughs. They are, however, in some respects, still in the embryo stage and need further examination. In particular the practical measures required to translate them into actuality need to be propounded, and the conference, designed to that end, resulted, we think, in some degree of clarification of the issues involved.

Theory of Gasfitting

Shortly after the outbreak of war we published in optimistic vein a large impression of R. N. Le Fevre's book, *Manual of Practical Gasfitting*. The great demand for this work thoroughly justified our optimism and our high regard of its practical contents, and before long the impression was exhausted. As a consequence of war conditions it was not possible for us to embark on a second impression of the book, though we have continuous enquiries about it. In his preface, written in August, 1939, the Author mentioned that he had in course of preparation a further book dealing essentially with the theoretical aspects of the subject. Again the war has precluded its publication. However, there is consolation in that Mr. Le Fevre is now contributing to the "GAS SALESMAN" a series of articles covering at any rate part of the ground. The first article appeared in the "GAS SALESMAN" for September, the second in the October issue, and the third will be published this month. The series links up easily-grasped but essential theory to that type of installation practice which we shall need post-war. As an experienced teacher the Author is addressing students of gasfitting in terms which they will readily understand.

"Journal" Subscriptions

With the prospect of a small increase in paper quota for the new rationing period, we are again in a position to accept a few new subscriptions to the "JOURNAL," and we should be glad to hear from enquirers whom unfortunately in recent years we have had to disappoint. We shall, however, still be unable to print copies for stock in order to satisfy later enquiries for odd copies, and an annual subscription will still be the only certain way of obtaining the "JOURNAL."

Personal

The Directors of the Bristol Gas Company have appointed Mr. ROBERT ROBERTSON, the General Manager of the Company, to fill the vacancy on the Board caused by the death of Mr. F. C. Burgess. Mr. Robertson joined the Company in 1905, and was appointed Chief Engineer in 1918. In 1939 he became General Manager, and this office he will now combine with that of Director. Mr. Robertson is a member of the Institution of Civil Engineers, the Institution of Mechanical Engineers, and was President of The Institution of Gas Engineers in 1938.

* * *

Mr. A. G. HIGGINS, who, as announced in the "JOURNAL" last week, has been appointed Assistant Secretary of The Institution of Gas Engineers.

* * *

The resignation of Mr. F. BOWEN as Consultant Gas and Water Engineer has been accepted by Leigh Town Council.

* * *

Miss ETHEL M. WEBSTER, Home Service Consultant to the Wandsworth and District Gas Company, is now serving with the American Red Cross as Food Consultant, covering a wide area with headquarters at Andover.

Letters to the Editor

Association of Smaller Municipal Gas Undertakings

DEAR SIR,—Your readers will be interested to learn that a general meeting of the members of this Association has been held in Manchester to consider and approve the Draft Rules, and to obtain the views of members to assist the Committee in the preparation of a report to be submitted to the Ministry of Fuel and Power. The number of members enrolled is now 68, and others are expected.

20, *Brook Lane*,
Newcastle-under-Lyme,
Staffs.
Nov. 6, 1943.

Yours faithfully,
F. L. WIMHURST,
Hon. Sec.

Gas and the Public

DEAR SIR,—If the immediate task in the planning of the Gas Industry is the formation of the British Gas Association, similar priority should be given to the establishment of a Public Relations and Press Department at Gas Industry House to represent all the National Gas Organizations and with district liaison officers.

Meanwhile each undertaking should make one of its officials responsible for Press work within its area of supply and, in appropriate cases, this might be extended to public relations generally. The task need not occupy a great amount of time, provided it is expeditiously executed and the official responsible has an alert mind, a news sense, and some knowledge of Press technique. The Gas Industry has, or can acquire, material in abundance.

Public Relations and Press work should be distinguished between themselves and from the mere buying of advertising space, which, if a simple, is often an extravagant and not necessarily an effective means of publicity. The editorial inch is of more value than the advertising yard. News and advertising are complementary, and should be related to and associated with other forms of publicity.

What can be done is illustrated by the reception given by the National Press to the "Report on the Planning of the Gas Industry."

In its second leading article to-day *The Times* describes the Report as a "stimulating document" and "a notable contribution to the discussion of industrial reconstruction," setting "a standard of thinking which few similar documents have yet attained," and one which is "singularly free from partisan spirit" and deserving of "careful and sympathetic consideration."

Yours faithfully,
"BLUE-PRINT."

Nov. 4, 1943.

Obituary

In the "JOURNAL" of Oct. 27 we briefly announced the death of Mr. FREDERIC JACKSON ANGELL, which occurred on Oct. 25 at his home in Malden, Surrey. He was 73 years of age, and had been associated for some 46 years with the firm of Humphreys & Glasgow, Ltd. Mr. Angell received his engineering training at Stevens Institute of Technology, Hoboken, U.S.A., and following practical experience in U.S. railroad engineering, joined Humphreys & Glasgow in 1897. During his early years with the firm he was in charge of the construction and operation of water-gas plant in many parts of Europe. During the first World War he was chiefly engaged in the construction and operation of installations of plant for the production of hydrogen used for naval and military purposes. Elected to the Board of Humphreys & Glasgow in September, 1914, Mr. Angell was principally concerned in recent years in project engineering, and many examples of H. & G. plant have been designed and installed under his guidance. During his 46 years in this country Mr. Angell made many friends who admired and respected the thoroughness with which he examined all the problems entrusted to him, and who valued the advice which he was always willing to give.

Diary

Nov. 15.—London and Counties Coke Association: Finance Committee, 11 a.m.; Executive Committee, 11.30 a.m.; Central Committee, 1.30 p.m., Gas Industry House.

Nov. 15.—Gas Companies' Protection Association: Executive Committee, 5, Victoria Street, 2.30 p.m.

Nov. 17.—Eastern Counties Gas Engineers' and Managers' Association: Gas Industry House.

Nov. 23.—Southern Association of Gas Engineers and Managers: General Committee, Gas Industry House, 11.30 a.m.

Nov. 26.—Southern Association of Gas Engineers and Managers (Eastern District): Committee, Gas Industry House, 11.30 a.m.

Nov. 26.—Southern Association of Gas Engineers and Managers (Eastern Section), Paper by Dr. Weston and Dr. Haffner, entitled "New Evidence in regard to the Mechanism of Carbonization in Continuous Vertical Retorts," Gas Industry House.

Manchester Juniors

A meeting of the Manchester and District Junior Gas Association was held in Liverpool on Oct. 23. Mr. J. Graham presided.

The President declared the following duly elected for the session 1943–44:

President—H. H. Thomas, B.Sc.
Senior Vice-President—J. Graham.
Junior Vice-President—D. Benson, B.Sc., A.I.C.
Hon. Treasurer—E. Kenyon.
Hon. Secretary—F. Johnston, F.C.I.S.
Council—E. Bates, F. Bell, B.Sc., F. Cartledge, E. B. Fields, W. Hodkinson, J. C. Hogg, A. Ormrod, B.Sc., A.I.C., J. A. Speers, B.Sc.(Eng.).

Mr. J. Graham installed Mr. H. H. Thomas into the Chair, and invested him with the presidential collar and badge of office. He remarked on the coincidence that two members of the staff of the Liverpool Gas Company were Presidents of the Senior and Junior Associations at the same time—Mr. W. Fletcher being the President of the Manchester District Association of Gas Engineers and Mr. Thomas President of the Junior Association. In 1932 a similar coincidence occurred, when Mr. H. P. Lupton was President of the Manchester and District Junior Gas Association and Mr. Ralph Gibson was President of The Institution of Gas Engineers.

Mr. Thomas thanked the members, and expressed their thanks to Mr. Graham for the able manner in which he had conducted the affairs of the Association during his year of office.

Mr. Thomas then gave his Presidential Address, which will be referred to subsequently in the "JOURNAL."

Mr. D. Benson, proposing a vote of thanks for the Address, said it would have evoked a great deal of discussion had this been permissible. Mr. J. A. Speers seconded the vote.

A vote of thanks to the Chairman and Directors of the Liverpool Gas Company was proposed by Mr. F. Cartledge and seconded by Mr. E. B. Fields. Mr. C. H. Leach, General Manager of the Company, responded.

Institution of Gas Engineers

The Council of The Institution of Gas Engineers met in London on Oct. 12, when a report was made of the work of the Technical Committees of the Institution, among them:

Gas-Works Safety Rules Committee, with particular reference to a Note on Ventilation of Retort Houses, approved by the Gas-Works Safety Rules Committee in consultation with representatives of the Ministry of Home Security and the Factory Department of the Ministry of Labour and National Service, for circulation by the Ministry of Fuel and Power.

Joint Lighting Committee: A letter relative to gas street lighting in the immediate post-war period was approved for circulation to all gas undertakings.

Gas Installations Committee, the Final Report of which is nearing completion for submission to the Ministry of Works.

Codes of Practice Sub-Committee, the six Panels of which are proceeding with the drafting of Codes of Practice for submission, through the Sub-Committee, to the main Codes of Practice Committee of the Ministry of Works.

The Report of the Committee of Enquiry on Coke Quality, Part II, was approved for publication.

Applications for affiliation to the Institution were received and approved from the British Junior Gas Associations' Joint Council and the Waverley Gas Association.

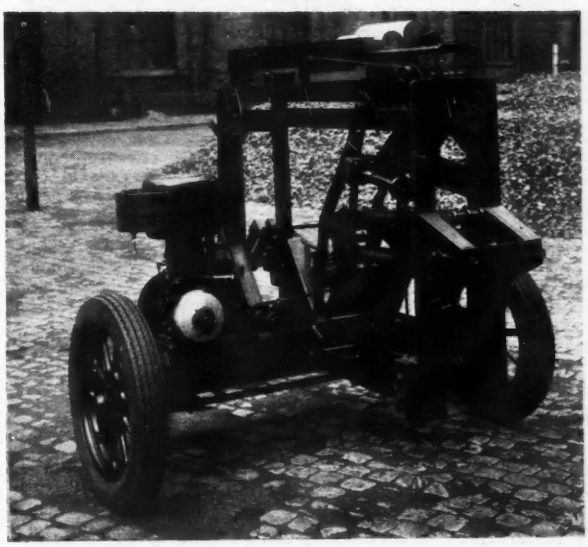
Manchester Regional Gas Industrial Council

Following a business meeting of the Manchester Regional Joint Industrial Council for the Gas Industry held on Nov. 1, the Council was entertained to lunch at the Engineers' Club, Manchester, by the United Kingdom Gas Corporation, Ltd.

The function was made an opportunity of making presentations to retired members of the Joint Industrial Council, who were Mr. S. Tagg, J.P., General Manager of the Preston Gas Company, Mr. Ernest Astbury, formerly Chief Engineer of the Liverpool Gas Company, Mr. Ernest Parry, formerly Commercial Manager of the Oldham Corporation Gas Department, and Mr. William Watson, formerly a representative of the Transport and General Workers' Union.

The Chairman of the Council (Colonel W. M. Carr), on behalf of the members, presented to Messrs. Astbury, Parry, and Watson initialled pigskin notecases as a mark of esteem, and as a memento of their association with the Council over a number of years.

In making a joint presentation to Mr. Tagg on behalf of member undertakings of the Federation of Gas Employers in the Manchester District and the employees' side of the Joint Industrial Council, Colonel Carr referred with warm appreciation to the able and untiring service which Mr. Tagg had consistently given in his leadership of the Employers' Federation as its Chairman for the past twelve years, and also as Chairman and Vice-Chairman in alternate years of the Regional Council over a similar period. He had been associated with both bodies since their inception in 1919. Mr. Tagg had chosen to accept a cheque, with which he proposed to purchase War Savings Certificates, and the presentation therefore was made in token form.



Our photograph is of a machine designed by Mr. C. R. Wilkin, M.B.E., Rochdale Road Works, Manchester Gas Department, for discharging clay at the open end of a broken gas main.

PLANNING OF THE GAS INDUSTRY

Digest of the Report of the British Gas Federation submitted to the Ministry of Fuel and Power on Nov. 3

Preamble

THE Post-War Planning Committee of the British Gas Federation was appointed to report as to the basis upon which the Gas Industry should be planned to meet the altered conditions of the future. The Committee has appointed Sub-Committees to report upon (*a*) Manufacture and Distribution, (*b*) Utilization, (*c*) Methods of Charge and Statistics, (*d*) Coke Oven Gas, and (*e*) Statistical Survey of Undertakings. The Survey Sub-Committee has submitted a "Report on a Survey of the Gas Industry in Great Britain," giving statistical data as to the Industry at the end of 1937. The National Gas Council and the British Commercial Gas Association are to be merged in a new organization—the British Gas Association—and the immediate proposals of the Committee are, therefore, largely framed to create organization, procedure, and authority.

Factual Aspects of the Gas Industry

The Gas Industry is one of the largest industries in Great Britain, comprising (at the end of 1937) 1,079 undertakings, having an embarked capital of £238 million and employing directly and indirectly 250,000 persons. In that year the Industry sold 1,527 million therms of gas to 11,390,738 consumers, and produced 12,943,190 tons of coke, and over 1 million tons of tar, benzole, and other chemical by-products. Since 1937 the output of gas has increased considerably, but publication of the relevant figures is prohibited for reasons of national security.

Development of Heating by Gas

The Gas Industry affords the "cheapest known means of distributing potential heat energy in a convenient form."

With gas price tariffs corresponding to the costs of supply, the domestic purposes (such as cooking, hot water and space heating) for which gas is comparable in price with coal could be greatly extended.

Gas affords to industry a continuous and convenient fuel supply which avoids waste, storage, and handling. Absolute control is secured, pre-arranged temperatures and furnace atmospheres are maintained, and comfortable working conditions are achieved.

The suitability of a fuel is dependent upon its efficiency in utilization, of which the prime fuel cost is only one aspect.

The supply of gas for industrial purposes is important as a balancing load, and as a means of making cheaper gas available to domestic consumers.

The enormous increase in the demand for industrial gas illustrates the need for extending heat surveys, and of making the results generally available to industry.

Coal Conservation

By its annual processing of 20 million tons of coal costing £25 million the Gas Industry secures gaseous, solid and liquid fuels and numerous by-products to the value of £75 million, each of which is better suited to the performance of specialized tasks than was the original coal. Coke is smokeless, and gives a higher thermal efficiency than is obtained with bituminous coal.

Gas represents the peak of present technical achievement in supplying a refined fuel affording great precision of control over both rate of use and attainment of perfect combustion conditions.

Before the war the use of gas and coke saved annually 15 to 30 million tons of coal, net; from the 20 million tons of coal carbonized were sold 1,500 million therms of gas, over 8 million tons of coke, 250 million gallons of tar and 20 million gallons of benzole, among other products. These savings have been accompanied by a considerably higher standard of living.

It is unlikely that the savings which result from the high flexibility of gas in use will ever be reproduced by solid fuel. A labour-saving, clean and convenient fuel, gas has the additional merit of conserving coal. With suitable gas tariffs, gas and coke could provide a fuel service superior to and cheaper than any practicable alternative.

Co-operation between the fuel industries can ensure that no citizen shall, in future buildings, find himself deprived of the opportunity of making use of developments in the technique of fuel supply.

Fuel and the Future

Wasteful competition between the fuel industries must be eliminated and co-operation substituted, to facilitate which a National Fuel Advisory Council should be established.

Owing to gasholder storage the peak demand and load factor are less critical with gas than with electricity supply.

Substantial economies in installation and consumption are possible if the house is planned from the outset for the use of gas.

The use of gas and coke is of national importance in reducing atmospheric pollution, which damages health, property and vegetation, is destructive of social amenities and occasions unnecessary labour.

For domestic and quasi-domestic purposes the average standard of technique in the utilization of fuel has been backward in this country. The demand for gas and coke for domestic purposes could be doubled, while the field for industrial purposes represents more than the present total output of the Gas Industry.

The Gas Industry is able to meet the demands and problems of the future. The foundations of its National Organizations have for long been well and truly laid and development has been comprehensive and effective.

But the Industry must operate with full appreciation of its unity and less emphasis on the independence of its component parts, so as to ensure the "most efficient use of our coal resources."

Legislation and Integration

Whatever the future form of control and organization of the Gas Industry, the practical problems will remain the same. Re-planning should be flexible, and based upon the principle of co-operative company and municipal enterprise appropriately controlled.

The Gas Industry possesses no fuel monopoly; the gas consumer is never without practical fuel alternatives—a consideration which provides the greatest incentive to service. But the Gas Industry should have equality of opportunity amongst its competitors, and consumers should have reasonable freedom of choice among the fuels available to them.

Gas legislation should be reviewed and enabling and flexible enactments substituted, while geographical integration should be encouraged and expedited to reduce the number of separate undertakings.

Legislation

An expert Committee of the Gas Industry is reviewing gas legislation —which controls most aspects of its business—with a view to the removal of anomalies and unnecessary restrictions and the avoidance of discrimination between the fuel industries.

The legislative system of dividend and price control needs revision since, while the object may have been to reduce flat rate gas prices, the consequence has been the reduction of the latitude for price concessions below such prices.

Enabling legislation is necessary more readily to permit gas undertakings—as other fuel industries—to recover from consumers, by rational methods of charge, sums more appropriate to the costs incurred, a large body of existing consumers being unremunerative.

It should be considered if standing charges for the provision of gas and electricity services (other than the appliances) should be met by the landlord, leaving the tenant to pay, at lower levels, for the fuel itself.

Integration will involve considerable expenditure, and legislation will have to provide up-to-date facilities for the raising of adequate capital.

While ministerial sanction will be necessary in many matters, the problems of undertakings (such as those enumerated) are best resolved by the Industry, which is organized to ensure that its recommendations are observed by undertakings.

Geographical Integration

The rigid unification and uniformity of the Gas Industry would probably result in more loss than gain to the average user. Size of itself is no absolute criterion of efficiency. But the resources of the smaller independent undertaking are necessarily limited.

Voluntary effort has led to much geographical and functional integration, and the desirability of accelerating such development is fully recognized. Already the extensive amalgamation or association of undertakings has resulted in considerable benefit to consumers. All such effort should be reinforced by the recently-established Ministry of Fuel and Power, the creation of which the Gas Industry had consistently advocated.

It is axiomatic that a utility providing such an essential commodity as gas must be controlled, but there is nothing to indicate, for the following reasons amongst others, that the particular needs of the Gas Industry are such as to require recourse to the revolutionary expedient of nationalization, that is, the substitution of direct or indirect State or semi-State ownership and/or management for company and municipal enterprise.

(i) Nationalization would create controversy at a time when co-operation and development are especially desirable.

(ii) Nationalization would necessitate the creation of a State monopoly of all fuel and could not be introduced for some years.

(iii) Nationalization would constitute the substitution of a revolutionary experiment, which could not be undone, for the successful rendering of a public service by company and municipal enterprise appropriately controlled.

(iv) The Gas Industry is highly specialized, technical, and competitive; its service, being personal and never-ending, demands flexibility and local knowledge.

(v) The problems of the Gas Industry are not such as to require nationalization as the means of achieving co-operation on a national scale, but call for development on evolutionary lines.

As nationalization is not suited to the whole, so it is not suited to part of the Gas Industry. But district schemes of gas manufacture and transmission will continue to be developed, often differing in area from that in which the sales of that gas to the user are controlled.

The principal methods of geographical integration adopted in the past should be encouraged and facilitated, namely, the amalgamation of contiguous undertakings by a company, municipality, or joint gas authority or the association of undertakings under a gas corporation. As a result of the co-ordination, efficiency and economy achieved, substantial benefit has accrued and will accrue to the community from such integration.

One Transmission Company exists for the purchase of gas from gas-works and coke oven plants and its supply in bulk through trunk mains to undertakings for local distribution. The establishment of such companies should be facilitated.

Joint working agreements between undertakings, which should be encouraged, have led to co-ordinated gas manufacture and distribution and to co-operation in policy and practice.

The regional supply of gas throughout the country by District Gas Boards, indirectly under the control of the State through its nominees on the Boards, could not be justified as being preferable to the extension of present methods of integration.

The ascertainment of the most appropriate method of geographical integration to meet the needs of a particular area is a specialized and complex matter, involving consideration of many factors and access to adequate statistics. But the general transfer of company undertakings to municipal ownership (or *vice versa*) would, of itself, solve few (if any) of the integrating or other problems of the Gas Industry.

Large undertakings, or groups of associated undertakings, form a natural focus for the development of integration, which should first be directed towards gas manufacture and transmission.

Responsibility for expeditiously bringing about a comprehensive measure of rational integration must remain with the owners of undertakings. The formulation and execution of their plans will be facilitated by the setting up of District Proprietors' Panels, which will seek the co-operation of the Ministry of Fuel and Power and the British Gas Association and its District Councils. Any integrating proposal which could not be agreed, or to which the Ministry withholds consent, should be referred to an Integration Tribunal which Parliament should appoint.

Functional Integration

Functional (as distinct from geographical) integration—that is, integration in the practice, policy and organization of undertakings and their National Bodies—will be facilitated by the Ministry of Fuel and Power (in particular through the proposed National Fuel Advisory Council and the recently-established Gas Industry Advisory Committee) and by the British Gas Association.

The National Gas Organizations (the names of which are enumerated) cover all aspects of the Industry. Virile, representative, fully-supported, and authoritative, they enjoy goodwill within and outside the Industry and the confidence of the public and of the Government Departments with which they co-operate. The British Gas Association will embrace or represent all such Organizations and be the composite voice of the undertakings, whereby co-operative effort will be maintained and extended and the existing urge towards integration made effective.

British Gas Association

The British Gas Association will be financed by the undertakings, each represented on a District Council, which will elect the Central Council. The membership should represent not less than 95% of the total gas sold. The Headquarters and District Offices will be appropriately housed and staffed. The District Councils will guide local development, advise the Central Council and collect and disseminate information. The Central Council and the District Councils will appoint such Committees as are necessary.

Regional Fuel Advisory Councils should be established to maintain contact with the District Councils and the National Fuel Advisory Council.

Personnel

Employees of the Gas Industry enjoy a substantial measure of social security. Close co-operation between management and labour has avoided misunderstanding and friction, towards which substantial contribution has been made by the Trade Union representatives on both National and Regional Joint Industrial Councils.

The instruction, training and examination of technical and commercial personnel is general, and is continually being extended by co-operation between the undertakings, the National Gas Organizations and the Universities and Technical Colleges.

Any fear of adverse result on the individual consequent upon integration should be removed.

The undertakings and the British Gas Association should assess and formulate their respective personnel requirements so as to be in a position to reinforce their staffs when qualified and experienced men and women become available on the cessation of hostilities.

Research and Technical Development

The Gas Industry has for long recognized that its full development depends upon sustained scientific research. It is estimated, for example, that, between the wars, the thermal efficiency of gas appliances was increased by about 20%.

Fundamental and long-term research is conducted by the Gas Research Board in association with the Department of Scientific and Industrial Research, and is thus co-ordinated with other fuel research. Many basic problems are at present under investigation.

Applied research into the manufacture and utilization of gas is conducted by the large undertakings and by the manufacturers of plant and appliances. Considerable scientific and practical progress has been and is being made.

The recently established Regional Gas Engineering Advisory Boards of The Institution of Gas Engineers are securing, by local investigations, the maximum economy and efficiency in gas-works processes. This voluntary service may be extended, under a suitably staffed organization, to secure, *inter alia*, the formulation and observance of technical standards in gas manufacture.

Industrial Gas Centres investigate and resolve numerous consumer problems appertaining to the application of gas to particular heating processes, which are of supreme importance to the industries concerned.

Area Technical Development Centres are proposed. They would incorporate the Industrial Gas Centres, and would work in close co-operation with The Institution of Gas Engineers, the Gas Research Board, and the British Gas Association, and in collaboration with the District Commercial Development Committees. Co-operatively based on large undertakings, the Centres would carry out, on an extended and co-ordinated basis, applied research, technical development, testing, and personnel training.

Investigation of problems relating to the production and utilization of coke, tar, benzole, sulphate of ammonia, and many chemical by-products is conducted by the Industry and by the National Organizations charged with the development of these products.

The testing of appliances, fittings and materials, to ensure appropriate standards of quality and performance, together with the training of personnel, is especially suited to full co-operative working.

Manufacture and Distribution

In the interests of economic carbonization, co-operation with the Ministry of Fuel and Power and the collieries is necessary to maintain the quality of the gas coal used by each particular undertaking.

Standards of gas and coke manufacture, distribution and quality will be observed as a result of the exercise of the agreed authority of the British Gas Association, supported by Ministerial sanction if and when necessary.

At the end of the war there will be required considerable reconstruction and renovation of gas-works plant and the extension of distribution mains to meet the increased consumption which will follow the adoption of a national fuel policy.

The inter-connexion of an undertaking with gas-works and/or with coke oven plants for the supply of gas becomes desirable where works are too small to be economic engineering units, are handicapped by obsolete plant, have difficult access to coal, or for other reasons have a high cost of gas or a low standard of output or service. There are, however, definite limits to the distances over which gas can be economically transmitted and adequate wayleave facilities are essential.

The purchase by gas undertakings of coke oven gas, where economically available, is in the interest of coal conservation. With suitable safeguards and legislative provisions it could be required that all sales of coke oven gas to the public should be effected through the Gas Industry, and that appropriately situated gas undertakings should accept, upon economic and equitable terms, all available coke oven gas, of regular and suitable quality, before engaging upon gas production on their own account.

The gas sold per ton of coal has increased some 40% during the last 40 years. Long-term changes in engineering technique are to be expected.

Commercial Policy and Practice

Where material contrasts of commercial policy and practice exist between gas undertakings in the same part of the country, the result may be a feeling of exasperation on the part of the consumer.

The broad lines of commercial and technical policy will be formulated in future by the British Gas Association, but its interpretation and practice will be local responsibilities involving co-ordination between neighbouring undertakings. Commercial development and publicity Services and facilities will be afforded by the Commercial Development Board of the Association in conjunction with District Commercial Development Committees, which will work in close collaboration with the Area Technical Development Centres. Thus will be ensured close liaison between the commercial and technical sides of the Gas Industry.

Pending the full development of integration, small undertakings will be accorded a special extension of existing commercial and technical facilities.

Factual evidence now becoming available will materially aid the determination of a wide variety of matters relating to commercial policy and practice.

The more equitable, logical, and rational procedure of charging consumers would be, as far as possible, to exclude extraneous costs, subsidies and deductions (such as those in respect of appliances and their maintenance) from the gas price.

Reduction in the price of appliances would be facilitated by the co-operation of undertakings with the manufacturers in planning the economic production and delivery of standard lines.

Some 4 million new houses are to be erected after the war. Reasonable freedom of choice must be allowed to householders in the selection of fuels, which requires that houses be built with flues and piped for gas.

Co-operation has been established to meet the heavy demand anticipated for post-war appliances of high performance, attractive appearance and low price. Agreement has been reached as to sizes, rating and standards of performance of gas cookers.

The development of off-peak load should be encouraged, and methods of charge should have greater regard to the cost of supply and be limited to a few simple and equitable alternatives.

National and local publicity which is informative and reliable about gas service will be as essential in the future as in the past. The National Gas Council and the British Commercial Gas Association, as such, will cease to exist, but continuity is assured in that their invaluable work will be carried on, co-ordinated and extended by the British Gas Association.

The ultimate responsibility of owners (company and municipal) for the development of undertakings must remain, but it is anticipated that the British Gas Association, as expressing the accumulated experience and common policy of the gas supply industry, will be readily accepted as counsellor, guide, and competent authority.

Costing and Statistics

The adoption of agreed costing systems and the compilation of general statistics are imperative, and should be facilitated by the establishment by the British Gas Association of a Statistical Bureau, to which undertakings should be obliged to render standardized statistical information. The results would be made generally available and would be of increasing importance, both in respect of immediate re-planning and future development.

Conclusion

The enormous contribution made by the Gas Industry towards the prosecution of the war has emphasized the essential importance of the Industry to the Nation, and has demonstrated its capacity to meet unprecedented conditions and the circumstances of the future. If, at the same time, the desirability of reconstruction has been made clear, so has the ability of the Industry to develop its future on the evolutionary and flexible lines proposed in the Report.

TEN POST-WAR THOUGHTS

By JAMES CARR, M.B.E.,

Engineer, General Manager, and Clerk, Stratford and District Gas Board

WHEN our President asked me to contribute a Paper during his year of office, the thought went through my mind that I should give particulars of the selection and installation of a second carbonizing plant at Stretford, which was completed in 1938. On second thoughts a more suitable occasion will no doubt arise to give my colleagues in the Industry a full and detailed description of the new plant, so therefore I should devote myself for a few minutes on thoughts which are continually going through my mind on the future of Stretford Gas Board when hostilities have ceased.

In the Gas Industry for the last 18 months we have all been giving a certain amount of thought to post-war planning; some of us have been speculating as to how our undertakings would function if unfortunately partial or full government control was exercised. Various suggestions have been put forward for operating the Industry; some of them have embodied in them a certain amount of government control; all of them, however, appear to be very much in the air, and are vague and general in character. I am repeatedly coming to the conclusion that the safest course to adopt is to examine our methods of operation and trading when war broke out, and to see where improvements can be carried out, and prepare a plan accordingly, so that each undertaking attempts to function satisfactorily and economically. My ten post-war thoughts are as follows:

1. *Was I satisfied up to September* 3, 1939, *with the domestic sales programme and policy?*

I think we shall all have to consider the question of salesmen very much more carefully than we have done in the past; our district organization for contacting the whole of our consumers will want more carefully arranged allocation. It is vital that we select the right type of salesman, because his contact with the consumer is in the end the undertaking itself. It must be instilled into all our salesmen that the art of selling an appliance is not the be all and end all of gas service, therefore they must know their appliance and its capabilities very fully; any false representation on their behalf can lose us goodwill should an appliance be installed and not turn up to expectations. We want less of the high-pressure type of salesman, but very much more of the accurate, knowledgeable salesman who is prepared to meet his own allocated consumers month by month with confidence, knowing full well that the appliances which he sells will give reliable and efficient service, and will build up confidence between the gas consumer and the undertaking.

In peacetime no salesman was put on the district until he had passed through a salesman's course, which was terminated by examination. This course of training lasted five weeks, and was planned and arranged by our own staff. The subjects briefly dealt with were: Manufacture, distribution, meter construction and size relative to consumption, renovation of appliances, coke production, grading, and application, cooking, heating, water heating, lighting, operation and working of two-part tariff, job ticket system, maintenance work, showroom liaison, costs and hire purchase facilities, accounts and office routine in relation to showroom practice, building developments and the system of co-operation with the builder, selling of appliances, electricity tariffs and competition. The fifth week is spent part in the showrooms, and part on the district with an experienced salesman. Selection and training of intelligent sales and service representatives should not be confined to the ranks of our own Industry.

In reviewing Stretford's sales for the five years prior to the war they show a fairly steady increase, and the purchase value of the total sales made over those five years are as follows:

1935	£25,185
1936	£32,984
1937	£37,507
1938	£41,724
1939	£32,511

The latter year was definitely affected by the rumours of war and, of course, the preparation for war. Building in the Board's area was very much curtailed, and many consumers themselves were somewhat sceptical of entering into hire-purchase contracts at that particular time.

The sales service in 1937 was developed by the allocation of district salesmen operating from each of our showrooms; in fact each salesman was allocated approximately 3,000 consumers to service, to call upon, and in every way endeavour to look after as regards their domestic gas appliances. In each of the district showrooms, to operate and control these salesmen a consumer's record card was completed, all visits made to the consumer and all purchases were recorded on these consumer's record cards, and in addition to this information approximately 50% of the cards indicated the amount of electrical equipment in the house as well. We were, therefore, building up these cards with sufficient information to tell us where to intensify a particular campaign or where to try to market a particular type of appliance, and they showed us where we were losing or gaining ground with electrical competition. Unfortunately in the first few weeks of the war we lost practically the whole of our salesmen, but I am quite convinced that it is essential, once hostilities are over, to put immediate[ly] into operation a district sales campaign, and again allocate a certa[in] number of consumers to each particular salesmen with a definit[e] incentive to make good and lasting sales. It is no good making th[e] type of sales that we all know, where the consumer, after a time wishes he had never entered into a hire-purchase contract and regre[ts] the day the salesman ever called.

I am anxious that our consumers will look to their own particular salesmen to smooth out any of their troubles and difficulties as regards our domestic gas appliances; Mr. Brown or Mr. Wright is the man who can put the consumers' difficulties and troubles in order—in other words, close personal contact through our district salesmen.

Another thought, how long will it be before I can again press our two-part tariff, and will there ever be a possibility of reducing the charges again to somewhere near pre-war level? With high prices for

* Paper to the Manchester District Association of Gas Engineers and Managers, Oct. 29.

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coal and the increase in wages it may never be possible to get down again to pre-war level, but it should be possible to reduce considerably the prices now being charged for gas under war conditions.

There is no doubt that the majority of consumers when making a domestic gas appliance purchase seriously consider the operational cost of that appliance. Very high priced gas, therefore, will not assist the sales of appliances, nor will it assist consumption per consumer operating existing appliances. There is some similarity between the Gas Industry and the motor car industry. Motor cars are sold on performance, reliability, and cheapness of operation. All these headings can, and do, apply to gas appliance sales.

Summing up, therefore, my sales policy and thoughts on the matter:

1. I want to obtain intelligent salesmen or saleswomen.
2. Reallocate the whole of the district.
3. Arrange to proceed with the consumers' record cards and general statistics.
4. Fix and obtain as quickly as possible the right types of appliance for the particular area.
5. Look into the price of domestic gas, tariffs, &c.
6. Give the very best service through our salesmen and showrooms with, of course, the addition of extensive development of home service through the female members of our sales organization.

One final thought on sales programme and policy. Would women make the sales contact better than men? It is a woman's problem in the first place, and it is the housewife we have to satisfy. Perhaps they would. It is well worth while giving the question serious thought.

2. *Were the consumers getting value for money in the appliances they were buying?*

In the majority of cases I feel fairly satisfied that at pre-war prices consumers were in most cases buying gas appliances at very reasonable charges, and were getting appliances which gave satisfactory service for a number of years.

The two main thoughts I have under this heading are, first, I always consider refrigerators cost too much, and that if these had been round about the price of a high-grade cooker we could have sold them in their thousands instead of their hundreds. Secondly, on water heating, which was somewhat confused, there was a definite sale for instantaneous water heaters and another for storage heaters. After the war I think we are going to experience very serious competition in this domestic sphere from the electric immersion heater owing to its low capital cost and the ease in which it can be installed with remarkably little upset to the housewife. There are, of course, thousands of cases where instantaneous hot-water heaters can likewise be installed with very little trouble, but on balance we have far more internal work to do to install a hot-water appliance than our competitors have.

Under heading No. 2 one must also consider the number and selection of appliances. Did we offer the consumers too many types of cookers, gas fires, hot-water heaters, &c.? I realize that the housewife must, as soon as the war is over, again be given the opportunity of selection and freedom of choice; after all, one of her greatest joys in life in ordinary shopping was variety and freedom of choice. This, as we know, has been taken away from us all during the war, and once it does return in times of peace we should arrange our showrooms with an adequate and good selection of all types of appliances, paying particular attention to colour as regards cookers and fires. We all know that colour plays a big part, especially in the daily life of our womenfolk.

In pre-war days many of us put out quite a number of very small gas fires and radiators which we knew were not entirely satisfactory, especially radiators, and yet at the same time they were fairly costly to the consumer.

Were all the water heaters entirely 100% trouble free? In a good many cases we knew they were not. Perhaps it may not have been a case of the appliance not functioning properly. In a good many cases it was the method of installation which was wrong. We can therefore admit there were many occasions when the consumer did not get full value.

3. *Did the undertaking give adequate service to the consumers, as regards both maintenance and facilities for purchasing or hiring all types of domestic appliances?*

The Board's maintenance service covered all gas appliances in doctors' surgeries and waiting rooms; we have found that by maintaining this service with doctors, we have broken down a great deal of prejudice which apparently the medical profession have had from time to time with regard to the use of gas fires in bedrooms.

Our maintenance scheme also covers all refrigerators every three months, hot-water appliances, and all central heating installations.

Other general maintenance was carried out, but not on a very extensive scale. Only when a consumer had complaint about his gas fire, gas cooker, &c., did we send a maintenance man; and this I consider was a very weak link in our service to consumers.

It will be essential that our maintenance covers all appliances on a three or four monthly basis. Therefore our maintenance staff will require to be more highly trained than pre-war. A maintenance man should be able to service refrigerators, hot-water appliances, cookers, gas fires, &c. At the present time this undertaking has specialized maintenance men doing nothing else but refrigerators and hot-water heaters; it will be my aim with the Stretford Undertaking to try to obtain a first-class team of maintenance men who have been trained to service pretty well all types of gas appliances.

From the housewife's point of view, it is obviously very annoying to her to have first of all a man come to service the refrigerator, another to do the hot-water appliance, and perhaps a third man to service the gas fire and cooker. Naturally she wants to deal with one man, and have one visit made to her house per quarter, and feel that the man so sent can attend to all appliances in her house.

I think it would still be necessary to segregate central heating installations. These we have on separate maintenance cards, and as a rule it is a fairly extensive job to service them. Therefore they can be left to men specially trained for this work.

With regard to hire-purchase, obviously this will again come into operation. I am personally in favour of a short term hire-purchase scheme rather than one covering a period, say, up to ten years; two, three, and five years I think are long enough to cover the hire-purchase of most appliances. Hire-purchase which extends over a longer period is apt to become irksome to the purchaser, and many consumers if they are purchasing an article on a longer period than five years begin to think that they have overpaid. The enquiries as to the number of payments to be made increase considerably over the last few years of any hire-purchase transaction. Therefore, for consumers' satisfaction, the shorter the period the better from both the gas undertaking's and the consumers' point of view.

Dealing with simple hire, I always view this as an outlet, providing the rates are sufficiently low, for secondhand and reconditioned appliances where it is not possible to make a sale under hire-purchase terms for a new appliance.

One fault which I have found in Stretford with regard to simple hire is that we are inclined to overlook appliances on simple hire as regards maintenance, and sometimes they are left in consumers' houses far too long, and instead of becoming an advertisement the effect is just the reverse, so that there is a time limit even on appliances for simple hire if we are to retain the goodwill and the business of the consumer.

4. *Was the industrial gas department of the undertaking securing all the business it should have done? Was it doing enough investigation in order progressively to increase the gas load as and when industrialists wore out their solid fuel equipment?*

At Stretford considerable progress has been made in the last 15 years in the development of its industrial gas load. Only the restriction on publication of figures prevents me from giving you some interesting data for this Undertaking. We have, at Stretford, a separate department dealing entirely with all industrial gas matters, on the design and construction of furnaces. In peacetime all industrial consumers were visited regularly, and we have the entrée to some 200 industrial establishments in our area of supply. In many of the works our industrial gas engineer is welcomed by the firms concerned, and is taken into their confidence on all their various heat treatment problems. The Gas Board has rendered a particularly good service. In some cases the advice given has meant a reduction in gas consumption, but a retention of goodwill because a new method or new type of furnace has been installed which has been more economical in operation.

In normal times it no doubt will be necessary to spend much more time in conducting preliminary investigations on heat treatment problems, and it may be necessary in some instances to run the experiments for a very considerable period. To instance this remark we have been pressing one firm in our area of supply for a period of ten years on the proposed conversion of their plant from solid fuel to gas firing. A great deal of experimental work has been done, and eventually we have obtained the order for the conversion of their equipment from solid fuel to gas firing.

Industrially I am certain that fuel economy and efficiency are going to play a much greater part in the factory than they did before the war, and we must not just be content with getting gas into industrial establishments at cheap rates in order to secure the business, but it will have to be economical and efficient in operation.

While the Gas Board has a fairly accurate record of the number of industrial gas appliances in the manufacturers' works, our present information on these appliances will want some revision, and it will be necessary to keep a closer record of pieces of industrial gas equipment so installed or converted in the various factories, so that these in turn can be serviced and maintenanced on somewhat similar lines to the domestic appliances.

During the war we have, in a small way, designed and made quite a number of industrial furnaces in our own fitters' shop, and it may be an advantage in peacetime to extend this part of our activities. We have found we can make a gas test in many instances without going to a great deal of expense; it therefore tends to cover the experimental stage before industrialists commit themselves to furnace manufacturers.

Many furnaces have been designed and specifications prepared by the Board's Industrial Gas Department for construction by furnace manufacturers to meet the particular requirements of the industrial user.

(*To be continued*)

WHERE DO WE GO FROM HERE?*

By ARTHUR FORSHAW, M.Sc.,
Chief Chemist, R. & A. Main, Ltd.

DISCUSSION

The **Chairman** mentioned that his grandfather in 1860 made a gas cooker and roasted a joint of beef in it at Stratford-on-Avon. It was of sheet iron, circular, with flat flame-burners, which seemed to indicate that there was nothing new under the sun, if they were going back to flat-flame burners.

Mr. **L. W. Andrew** (Gas Light and Coke Company) suggested they ought to be able to spare a little time, even if it was leisure time, to the consideration and preparation of plans for the period immediately after the war in order to produce some modifications in appliances. It might not be possible to produce new appliances immediately, but it might be possible to produce appliances with interchangeable modifications substantially better than those turned out in 1938. If they did not, he believed they would find themselves behind other industries. He thought complaints could be made about gas cookers, and he would not feel very happy if he did not think that progress was being made. After the last war the competitor of the gas cooker was the coal cooker, but he thought after this war the competitor would be the electric cooker. They must go a stage further than a cooker that merely cooked, and have one which, for instance, was easy to clean. He did not agree that a great number of people did not use thermostats correctly, but he would say that enough had not been done to educate consumers in the use of them. He thought the Industry had a completely new opportunity in regard to water heaters. There was a new standard of living coming, and he entirely agreed that all types of water heater must be available. They could not put all their water into one bucket, and it was up to them to sell a water-heating service. The important thing was not how much gas per hour a heater could burn, but the cost over a period for an ordinary working-class person in obtaining the water necessary for him. As to gas fires, there was the hope of insulation in buildings put up after the war. Every room would have a flue in it and that would help a great deal. There was a tendency to take the efficiency of a gas fire on a bench and not in a flue. The practical efficiency was what mattered, and the average gas rate was not always the same as the full gas rate. There was also the very important question of making proper use of flueless heaters.

Mr. **C. M. D. Belton** (Shrewsbury) said he believed that after the war they would have, at any rate initially, to meet a demand for some form of standardization to meet the immense needs of re-housing. They ought not to allow that to hinder them in making progress in regard to more attractive cookers, both in design and in utility. He thought the use of thermostats was greater than was suggested and, in fact, that depended on the gas undertaking, because with a properly organized service department demonstrators would see that the housewife was adequately instructed. He thought this was one of the services which a gas undertaking should consider itself bound to give. In regard to water heaters he believed that they were generally troubled at present by the cost of maintenance. He knew that was partly due to the sulphur problem, but there was still much room for improvement in the design of water heaters so as to reduce maintenance costs and to facilitate the keeping of the heaters in an efficient condition. He would like to know more about what was in mind in regard to background heating. He did not think that consumers were going to be readily persuaded to add appliances for that purpose in addition to the gas fire which gave them radiant heat. Therefore it seemed they must try and combine the radiant and convecting effects, and in doing so they must be careful to avoid the production of dirt and dust traps in those devices which allowed convection currents to arise. That was one of the chief sources of trouble in years gone by.

Mr. **H. F. Potter** (R. & A. Main, Ltd.) said that the members of the Gas Stove Makers' Panel, despite their vital war commitments, had been working on the design, for production after the war, of a series of three new cookers, with many standard features, such as oven and hotplate dimensions, grill frets, oven furniture, overall heights, connexions, governors, and thermostat settings. In producing these new cookers each maker would retain his own individuality in outward design and finish. This point and many others in this connexion had been stressed in the evidence given to and the findings of the Committee appointed two years ago by the I.G.E.

Mr. **J. Patterson** said a friend of his had occasion to use an electric cooker for about ten days, and she expressed her firm conviction that the gas cooker was preferable to the electric cooker as far as hot water was concerned on the hotplate. There was not much in it as far as the oven was concerned, but the strongest view was expressed in reference to the griller. She was definitely of opinion that the electric griller was better than that of any gas cooker she had used.

Mr. **W. G. S. Cranmer** (Willenhall) called attention to the fragile nature of gas fire radiants. He cited a case where the fires were retained as long as the radiants were in condition, but were replaced by electric radiators because the gas radiants were so fragile. Was it not possible to produce radiants that would stand more knocking about?

Dr. **C. M. Walter** (Birmingham) said average efficiency applied particularly to water heaters, and he had carried out one or two tests with circulators. He found that on turning out the gas during the night period there was a marked improvement in the overall efficiency. This was due to the amount of gas that was wasted during the off period and during which the thermostat operated periodically.

Mr. **W. Elliott** (Derby) asked if they could be assured that the cost of sulphur removal would be remunerative.

Mr. **C. F. W. Rendle** (Redditch) expressed disappointment with the Paper because he had hoped for something constructive. He would not characterize it as destructive, but it had left an atmosphere of disappointment owing to the attitude of pessimism on the subject.

Mr. **Forshaw**, in reply to the discussion, said appliances developed with a view to the highest possible efficiency, such as water heaters, did not give more than 75 to 80%. In the hotplate they were dealing with the simplest possible form of apparatus, and he considered after long experience that if they achieved 50% under working conditions they were not doing badly at all. They could do better in the laboratory, but could they do it for the ordinary consumer? With a kettle with special arrangements it could be done, but people would not buy these kettles in the ordinary way and they would not be used unless they were supplied with the stove, and that meant raising the price. Personally he did not see where these "vast improvements" were coming from, gas being what it was and having regard to the way it had to be burnt. The improvements they were going to get were more in the way of easier cleaning, better looking appliances, and stream-lined appliances; but he did not think they would get appreciably higher efficiencies as such.

The fragility of radiants had been one of the most serious matters in connexion with the design of gas fires. Fifteen years ago they went into this very closely and they got out radiants that were nearly as imperishable as iron, but they cost a lot of money. They never had a real demand for them as people would not pay the price. Then, as practically all gas flames contained traces of iron products, unbreakable radiants gradually became discoloured and unattractive looking when cold.

One of the troubles with storage water heaters was that when they cut down a small flame, enough to maintain temperature, they got a large excess of air going through which reduced efficiency very considerably, as mentioned by Dr. Walter. They had made a storage heater which did not have that defect, but when the efficiency during maintenance was restored by reducing the excess air, it suffered from a tremendous amount of condensation. When they made provision for removing that they found it so corrosive that they could not find a metal that would stand up to it. He thought that was mostly due to sulphur. They had to drop the type.

As to grillers, he did not know what type was referred to, but modern gas grillers gave a fine performance. Their latest would heat in one minute from dead cold and thereafter give a side of toast every 45 secs. He did not think they could get anything faster with electricity. He did not think they had much to fear in that respect.

As to standardization, he pointed out that the Gas Stove Makers' Panel could only go as far in the matter of standardization as individual manufacturers could agree. They had reached a large measure of agreement, as Mr. Potter had already told them, but he did not think that gas cookers as yet would be interchangeable. Mr. Belton said that "stats" in his district were much more used. Mr. Forshaw said he did not want them to go away with the impression they were not generally used, but there was a certain proportion of consumers who did not appreciate them, and their mentality was such that they never would use them. That applied to any appliance that required to be used with intelligence.

He did not know what type of background heaters would be supplied after the war, but he thought it would be something very simple. The only drawback was the sulphur business. He did not know anything about the cost of removal, but he had seen it suggested that whatever the Gas Industry had to pay for it it, could not but be a very paying proposition.

In regard to instantaneous heaters, they had done considerable work to lengthen the period of time that must elapse before they required attention. They found in a non-condensing type that by attention to the spacing and material of the baffles and to the design of burner, the period could be increased by considerably more than had been thought possible. One thus improved was by a large undertaking given their standard accelerated test. In this a quarter of a million feet of gas were put through it without the usual faults developing. The undertaking thought there must be something "phoney" about the sample and demanded another, which, however, gave the same satisfactory results. One speaker had complained that his fitters were unable to increase the input of gas to such a heater, and Mr. Forshaw emphasized that this was a necessary precaution to take because these machines were sent out set to work at the maximum permissible input of gas of the calorific value and specific gravity supplied by the particular undertaking to which they were consigned. If this input were exceeded by even 5%, maintenance troubles were accelerated and life shortened to quite a disproportionate extent. He was, therefore, definitely opposed to giving either fitters or consumers any discretion whatever in increasing the input to heaters of this class.

(*Continued on p. 601*)

* Paper to the Midland Association of Gas Engineers and Managers, Oct. 21.

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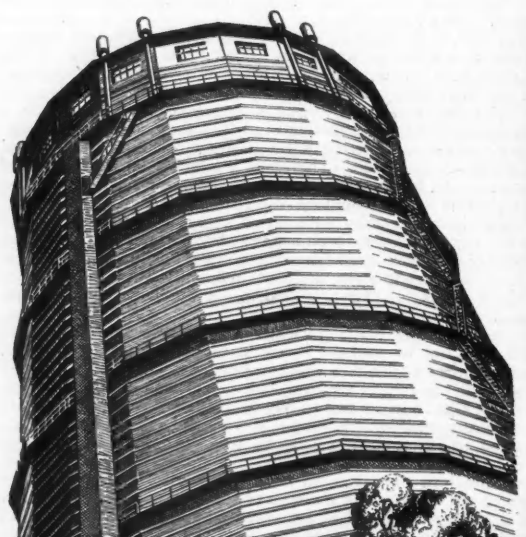

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YORKSHIRE JUNIOR GAS ASSOCIATION

THE Annual General Meeting of the Yorkshire Junior Gas Association was held in Leeds on Oct. 2. The meeting was opened by Mr. F. Beaumont (President). and he extended a welcome to Mr. N. Hudson, Managing Director of the Mirfield Gas Company, who is the President-Elect of the Manchester District Association of Gas Engineers; Mr. R. Halkett, jun., Secretary and Assistant General Manager of the Sheffield and District Gas Company; and Mr. C. S. Thomson, representing Mr. L. Hartley, of Messrs. Clayton, Son & Co., Ltd., Leeds.

In presenting his report, Mr. Beaumont stated that there was one point which had not been recorded therein, as the Council had decided it would be better to make a statement from the Chair at the annual meeting; the matter referred to was the question of affiliation with The Institution of Gas Engineers, which he considered was very important to the future of the Junior Gas Association movement. At the annual meeting of the British Junior Gas Associations' Joint Council, held in Leeds in September, 1938, they had studied the terms laid down by the Institution on which affiliation could be granted. After full discussion, the Joint Council at that time did not consider the terms satisfactory, and decided that no further action should be taken. Owing to the war, no further meetings of the Joint Council were called until September, 1942, when the matter was again raised. The Chairman of that meeting (Mr. H. Platt) was empowered to discuss the whole question with the President and Secretary of the Institution. It was reported that the terms still remained the same as in 1938.

The Council of the Yorkshire Junior Association met, and after full discussion unanimously decided that in view of this, and the possibility of the formation of a new Association (now known as the British Gas Association), application for affiliation with the Institution should be delayed, and every effort made to secure direct representation in the new Association. On Feb. 3, 1943, a special general meeting of the Joint Council was held in Birmingham to discuss this matter further and, if possible, to make a definite decision. The delegates from the Yorkshire Junior Association made a very strong protest against affiliation with the Institution, and asked that it should be delayed, and that the Joint Council (representing a membership of over 1,400) should press for a place in the constitution of the new British Gas Association.

Six Junior Associations voted in favour of affiliation, and one against (this being Yorkshire).

The Council of the Yorkshire Association again met and discussed the situation, realizing that they had but two courses open to them—the first to cut adrift from the Joint Council, secondly to fall into line under protest. It was ascertained that the Junior Associations would be left out in drafting the constitution of the British Gas Association. The Council then decided to adopt the second course, and he now asked members for a vote of confidence in the attitude taken by their Council during the whole proceedings. Mr. Beaumont said that one point which stood out very clearly in his mind was the fact that those responsible for the final drafting of the constitution of the British Gas Association had made a grave error in ignoring the Junior Associations, a body of over 1,400 technical and capable men, who are and always will be vitally interested in the future of the Gas Industry. He felt strongly that the Junior Associations should have direct representation on that body.

By the vote of confidence which followed, the members showed their approval of the action taken by Council.

The induction of the new President of the Association—Mr. V. J. J. Siddons, Engineer and Manager of Rawmarsh U.D.C. Gas and Water Departments, was performed by Mr. F. Beaumont, the retiring President.

Mr. Siddons thanked the Association for the honour conferred on him, and said he would endeavour to carry out his duties with the same dignity and enthusiasm as his predecessors.

A vote of thanks to the retiring President, Officers, and Members of Council was proposed by Mr. J. W. Carlton (Shipley), seconded by Mr. H. Lockwood (Barnsley), and carried unanimously.

Officers, Members of Council, and Representatives on the District Education Committee for the coming Session are:

President.—V. J. J. Siddons, Rawmarsh.
Senior Vice-President.—J. R. Firth, Bradford.
Junior Vice-President.—C. A. Newham, Leeds.
Hon. Treasurer.—J. Hargreaves, Bradford.
Hon. Secretary.—G. E. Banks, Sheffield.

Council.—D. C. Gunn, Leeds; C. J. Dougherty, Harrogate; W. T. Hird, Sheffield; A. Wilkinson, Huddersfield; S. Davies, Sheffield; A. P. Jennings, Leeds; T. H. Nicholls, York; M. Hamshaw, Huddersfield; D. C. Henderson, Bradford.

Ex-officio Members of Council.—A. Wylie, Sheffield; F. Beaumont, Meltham.

Hon. Auditors.—A. W. Arnold, Bradford; D. C. Henderson, Bradford.

Representatives on District Education Committee.—A. H. Clucas, Leeds; G. Griffiths, Bradford; D. C. Gunn, Leeds; H. A. Fells, Sheffield.

The President then introduced Mr. N. Hudson, President-Elect of the Manchester District Association of Gas Engineers and called upon him to address the meeting.

Address by N. Hudson

It is possible that among my remarks there may be an odd item, or even some odd items, that will be of interest and even value to you, either individually or collectively.

I think it would be safe to say that never in the history of our Industry have those in both major and minor executive positions been faced with such a multitude of problems as they are to-day. It is not only a question of trying to meet and resolve the harassing problems that now confront us, and those in very truth are a severe enough burden, but at the same time, the majority of us, with an inborn or acquired belief in the value of our Industry to the nation, are now beset with the problem of post-war reconstruction. It is concerning the immediate future that I want to speak to you to-day—to touch on certain aspects that I think are worth examining.

Of the immediate past and present, suffice it to say that our Industry has every reason to be proud of its achievements, and when victory is accomplished, we ourselves will know, even if public and national acknowledgment is lacking, that our Industry has made a very full and complete contribution, and that this has been achieved in no small measure by the untiring efforts and resourcefulness of its executives.

Some may say that such a statement smacks of self-conceit, self-advertisement, and commendation, but is there anything wrong in we officials using reasonable and honourable means to see that our Industry, and the part we play in it, achieve rightful recognition, or are we for ever to hide our light beneath a bushel, and be unnoticed and forgotten in the press of to-day's and to-morrow's activities? Do you think that a quiet and maiden-like modesty does the Industry or its personnel any good under the competitive conditions prevailing in business to-day?

Does a reputable salesman, with a tried and genuine article for sale, lock it up in his strong-room? Not on your life!—he advertises it and displays it advantageously for all the world to see, and finally tries to sell it at a fair and honest price. Why should we, then, not tell the country of the value of the Industry and ourselves, and try to achieve that status and remuneration to which we know ourselves, by comparison, to be worth?

I hold that, in this regard, it is high time that the National Bodies gave unlimited support to any and every effort that is made to raise the prestige and standing of the Industry and of all the members of gas executives. Surely any fully qualified and capable gas executive officer is no whit less entitled to rightful recognition and remuneration than any other executive business officer bearing corresponding responsibilities, and why there should be reluctance shown in striving for this is beyond my comprehension.

I only hope that as a result of the perseverance and untiring effort of a certain few, something definite in the question of salaries may soon be settled, and that the results will be such that juniors of ability and initiative may know that in our Industry there are opportunities for adequately paid advancement that will be worthy of their mettle.

While on this topic, I would just like to refer very briefly to the training of juniors within the Industry. An old saying, for long repeated, was that profits were made in the retort house, and although it is obviously true that the more efficiently the retort house, or for that matter any unit in the production and maintenance line, is run, the more will it contribute to the profits of the undertaking, I still believe that commercial ability in management plays a greater part in final financial results than is generally recognized.

For that reason I feel that in the recognized training of juniors, opportunity should be given to them of acquiring commercial knowledge and experience, not just in book-keeping and accounts, but in costing, financial management, and the like, so that they may be the better enabled to suit their engineering knowledge to the requirements of the managerial and financial side of their undertaking. It is certainly true to say that commercial considerations have the final say in the majority of major decisions on policy and procedure that are made to-day.

That being so, how then can a junior executive officer hope to be fitted for full managerial responsibilities if his experience is limited to the practical side only of gas manufacture and distribution? For example, a sound engineering job and high gaseous thermal yields are but two of the considerations to be examined in making decisions as to the type of carbonizing plant to install, and in my opinion, the type of coal available, the labour position, coke and residual sales position, nature of gas load carried, both present and potential, and the incidence of these upon the financial position of an undertaking, are often more important considerations that should be investigated. Operational working, renewals and repairs, stocks and the like, can have a far greater influence on financial results through their reflective effect on taxation, rating, and the like, than an extra therm per ton from the retort house, and although I am not suggesting that that

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particular "extra" therm should be allowed to escape being registered by the station meter, I am suggesting that good gas engineering practice is not sufficient in itself to obtain the best results in a gas undertaking.

Now what of the future? At the moment, as I stated earlier, we are beset by the problem of post-war planning, and whatever decisions are come to on this question they will in no small measure shape the future of our Industry and the personnel employed therein. I suggest to you that post-war planning schemes are, therefore, or should be, the interest of every executive official in the Gas Industry, and I hope that those to whom the detailed reports have not been available have studied the Technical Press with interest and given serious thought to what they have read.

Anyone who imagined that the *status quo* of 1939 would be reverted to on the cessation of hostilities should, without a doubt, think again, and I do not think that many of us would wish that to happen. The Gas Industry has, for many years, held that of all the users of raw coal, it and the coke-oven industry were the only ones who, by and large, treated that national heritage with the respect due to it, and that national direction on this question was needed. This will be even more true after the war, when the national economy will require that the fullest use will have to be made of all national assets.

The war has made the country more fuel conscious than ever before, and one possible result of this may be the formulation of a national fuel policy. If that did happen, and the policy was honestly developed from verified data and statistics, I do not think our Industry need have anything to fear—in fact, providing we can give a gas service within the capacity of the population to pay, then I, for one, anticipate an increased demand for our products. On this question I want to suggest to you that the part we are allotted in that national fuel policy, and our ability to fulfil it, will depend to a great extent upon the form of reorganization applied to the national bodies within the Industry itself, and upon the case for the carbonization of coal put forward to the appropriate Government authority by the national executives.

What then is happening? I possibly know a little more than some of you, but even then my knowledge is limited, as is that of everyone except a chosen few.

On the former point you will all probably know of the proposal to form one national body, to be known as the British Gas Association, and in it will be incorporated or to it will be attached all the present national bodies. In this connexion I can tell you that Yorkshire, as represented by the chief officials of all gas undertakings, have taken exception to the proposed form and constitution of this new body, and have, in fact, submitted alternative proposals. Briefly the objection was based upon the fact that nominations from the whole country to the Central Board in London were to be limited to some 38 persons, who were to carry through the whole of the national work of our Industry, and to the fact that it was further laid down that when thought advisable, the said Board could pass on any particular item under discussion, to some sub- or *ad hoc* Committee appointed by the Board itself, and not the general body of members, so that detail work could be carried through.

In Yorkshire's opinion this could only mean that the four delegates it would, under this scheme, have power to elect would have to be men who were in a position to spend a great deal of their time away from their works, or alternatively, that many questions would be cut and dried, as they are to-day, by a small caucus in the Metropolis, and provincial opinion be expressed when it was too late to be effective, or even considered, and also that the constituent members of the Industry would have little or no say in the constitution of sub- and *ad hoc* committees, approach to whom could only be effected through the Central Board.

Yorkshire's alternative proposals did not suggest material alterations in the form of the Central Board which would be concerned with policy and finance, but it did suggest that the regional areas should, under the new constitution, be empowered to appoint a greater number of national delegates, so that sufficient men, elected in a democratic manner, and not at the whim or fancy of a few, would be available to carry through the national work, particularly in committee. The alternative proposals also incorporated provision for the automatic and definite liaison by representation of all national gas bodies with the Central Board, and for election of delegates to the Central Board through the main committees.

This latter provision would have enabled regional and individual opinion on any subject to be presented early in committee, before any final suggestions were placed before the Central Board, and in view of this, many of us in Yorkshire thought that a broader and much more representative viewpoint could be considered and much time saved.

Those proposals have been thought and adjudicated to show no advantage over the original, and, as far as we know, Yorkshire's hope of a new democratic national association, with central direction, capable of carrying through its work—and mark you, it will be onerous and all-important to every one of us—has not been fulfilled.

I would suggest, gentlemen, that these proposals are worth very serious consideration, since it is only wise to remember that once they are accepted as a constitution, they will be very difficult to amend.

Might I next refer to post-war planning in the broader sense, the planning which not only covers the internal affairs of the Industry, but its position and contacts with other fuel industries, the Government and the public. It would only be kicking against the pricks for anyone to object to any planning or integration, call it what you like, which could be proved to offer sound prospects of being to the advantage of the general public and/or the nation as a whole. But are we sure that instead of the case for or against such planning or integration being measured by the yardstick of such advantage, rather will the action taken be dictated by the tendency of to-day to accept such schemes as a necessary complement to post-war activities?

I, personally, feel that the latter tendency is to-day controlling affairs, and that because of its popularity, many people, from Government Ministers downwards, are making a fetish of the idea and stampeding themselves and others into making reports and recommendations which have not been given that consideration due to such important matters, and—make no mistake—the Gas Industry has been, or has allowed itself to be, stampeded. Would it not have been to the advantage of the nation and the Gas Industry if a much stronger stand had been made for time to consider this all-important matter, rather than to have allowed the present position to develop, in which reports, laboriously drafted, have been altered or withdrawn one after the other, abortive meetings called and either held or cancelled, and the members of gas executives and proprietors left groping in an atmosphere of doubt and bewilderment?

I would suggest to you that, even in these days of bureaucratic control, we are still an Industry of sufficient importance to expect and get, under fearless leadership, a tolerant and reasonable hearing of our opinions, providing they, in turn, are soundly and justly formed. We shall never get it, nor do we deserve to, by a subservient and "afraid-to-offend" approach.

Perhaps some members may be inclined to wonder why I have spent my time and theirs on discussing matters which, after all, many think, wrongly I contend, are the problem of the "higher-ups." I will tell you. It is my belief that the next few years will see enormous changes in our Industry, and I feel that it is only right that at meetings of this kind matters of a personal and general nature should occasionally be mentioned, to the exclusion of the technical problems which are our everyday consideration.

Every one of us will, to some degree, be affected, but the juniors possibly to a greater extent. Many of them have practically their whole careers before them, and I thought that what little I know on these questions would be interesting to them.

Youth has to date had very little say in our Industry, particularly if they were trained in it, and it is very perturbing to me that those who will have to carry through these plans now being made for the future are having so little say in their drafting. Possibly youth is to blame in some measure. They have considered these questions of national direction and control to be rather outside their province, but I would advise them to take a keener interest in and study more fully all these questions—to consider it part of their career equipment to know what is happening in national gas affairs, and to make their voice heard when opportunity presents the occasion. Knowledge gained by years of experience is truly a valuable asset, but without the enthusiasm and vision of youth it is likely to be narrow and over-cautious in outlook. On its own, that knowledge will not keep our Industry in the forefront in these days of changing ideas and development, and I hope some of us will see the day when our Industry, the Gas Industry, under sound and forthright leadership, will use not only the knowledge of years, but take full note of the enthusiasm and ability of youth, that the one, enhanced by the other, may redound to its benefit and success.

A vote of thanks to Mr. Hudson for his outspoken Address was proposed by Mr. J. R. Firth (Bradford). Mr. C. A. Newham (Leeds) seconded the resolution, which was carried unanimously.

Mr. C. S. Thomson, deputizing for Mr. L. Hartley, of Messrs. Clayton, Son & Co., Ltd., congratulated Mr. N. G. Appleyard (Leeds) on his Paper entitled "The Distribution System of the City of Leeds," read to the Association on Oct. 31, 1942, which had gained for him the Clayton Medal. He regretted that owing to restrictions it was not possible to procure the Medal, but he hoped that in the near future it would be possible to make the presentation.

(*Continued from p. 597*)

Mr. Forshaw added that he was sorry Mr. Rendle felt the Paper was pessimistic, because if it was so he had failed to give them a true impression of his own beliefs. He felt that his opening words were sufficient justification for not going into detail regarding future appliances, but just as Mr. Potter had raised the veil about cookers and indicated the direction of progress, so in due course appliances of the other classes would be dealt with.

Mr. **T. F. E. Rhead** (Birmingham) proposed a cordial vote of thanks to the Author, and paid a tribute to the work he had done for many years in the Fuel Department at Leeds University.

Mr. **F. C. Briggs** (Dudley) seconded the vote of thanks and Mr. **Forshaw** replied.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in the "Journal" should not be taken as an indication that they are necessarily available for export.

GAS PRODUCTS PRICES—STOCKS AND SHARES

The London Market Nov. 8.

All Coal Tar Products are in good demand, and Pitch in the London area remains about 45s.

An Order entitled The Control of Toluene (No. 3) Order, 1943 (S. R. & O. 1943, No. 976), came into force on July 20, and introduced certain changes in the prices for different grades of Toluene.

There are no changes to report in the prices of Coal Tar Products.

The Provinces Nov. 8.

The average prices of gas-works products during the week were: Pitch and Crude Tar,* Toluole, naked, North, 90's, 1s. 11d. to 2s. 1d., pure, 2s. 7½d. (controlled by the Control of Toluene No. 3 Order, dated July 14, 1943, operative from July 20, 1943). Naphtha and Xylole controlled by the Coal Tar Naphtha and Xylole Order, 1943, dated May 31 (S. R. & O., 1943, No. 768), operative from June 1. Carbolic acid, 60's, naphthalene, and anthracene controlled by the Coal Tar Products Prices Order S. R. & O. 2509, dated Dec. 7, 1942, and operative from Jan. 1, 1943. Filtered heavy oil (min. gr. 1,080), 7½d. to 8d. Creosote oil has been generally controlled as to direction and price for some time past. Current value—fuel grades 5d. to 5½d.; timber preservation and other purposes 4¾d. to 6d.

* In regard to pitch and crude tar prices we would ask readers to refer to the editorial note on p. 396 of the "JOURNAL" for Sept. 10, 1941.

Tar Products in Scotland Nov. 6.

Steady conditions prevail with prices unchanged. Refined tar controlled. Value is 4½d. per gallon *ex* Works, naked. Creosote oil: Specification oil, 6½d. to 7d.; low gravity, 7¼d. to 7½d.; neutral oil, 6d. to 6½d.; hydrogenation oil, 5⅞d. per gallon; all *ex* Works in bulk. Refined cresylic acid is in good call at 3s. 6d. to 4s. 6d. per gallon *ex* Works, naked, according to quality. Crude naphtha: 6½d. to 7d. per gallon. Solvent naphtha: Basic prices delivered in bulk, 90/160 grade, 2s. 8d., and 90/190 Heavy naphtha, Unrectified, 1s. 10½d.; Rectified, 2s. 3d. per gallon. Pyridine: 90/160 grade, 13s., and 90/140 grade, 15s. per gallon.

Although sentiment continued cheerful last week, stock markets were still inactive and, apart from a few bright spots occasionally, remained irregular.

The report of the British Gas Federation's Post-War Planning Committee, which was published during the week, brought "gas" very much to the forefront, but conditions in the Gas Market were no better than elsewhere. The volume of business was very small, and with the few exceptions shown below prices closed unchanged.

Among the ordinary stocks on offer appear 5,000 £1 ordinary stock of Primitiva Holdings Ltd. at 13s., yielding £6 1s.%. Since 1933/34, when a dividend of 2% was paid, the company has been gradually increasing its distribution, and for the past two years has made disbursements of 4%.

The following price changes were effected during the week:

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Associated Gas & Water Ord.	21/—22/-	+-/3d.	
Ditto Deferred	21/3—22/3	+-/3d.	
Gas Light 4 p.c. Pref.	95—98	+1	
Ditto 3½ p.c. Red. Pref.	94—97	+1	
Imperial Continental	89—92	—2	
Mid-Southern 4 p.c. Pref.	90—95	+1	
Oriental	112—117	+2	
South Metropolitan Ord.	87—90	—1	
United Kingdom Gas Corporation Ord. (*x.d.*)	21/6—22/6	Nov. 1	

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Newcastle Units	24/—24/6	+-/6d.

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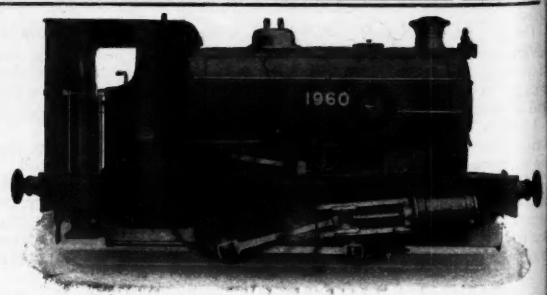
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